Evaluation of Per- and Polyfluoroalkyl Substances (PFAS) in Fish from the Potomac River Basin in 2024 - 2025

Occoquan River Watershed

VIRGINIA

September 11, 2026

Virginia Department of Health
Office of Environmental Health Services
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VDH VIRGINIA DEPARTMENT OF HEALTH

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September 11, 2026

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Dear Gabriel Darkwah,

Thank you for providing the Per- and polyfluoroalkyl substances (PFAS) fish tissue concentrations results for fish collected in 2024 and 2025 from multiple waterways in Virginia. The Virginia Department of Health (VDH) has finished reviewing the results for public health implications as requested.

BACKGROUND

The 2024 - 2025 annual routine statewide fish tissue monitoring primarily targeted the following river basins: Big Sandy River Sub Basin, Chowan and Great Dismal Swamp Basin, James River Basin, Potomac River Basin, Shenandoah River Basin, Rappahannock River Basin and the Roanoke River Basin. The 2024 and 2025 data for the Potomac River Basin, specifically the Occoquan River Watershed, reviewed include 252 edible fish tissue fillet samples, which were tested for PFAS as part of the Virginia Department of Environmental Quality's (DEQ's) statewide sampling and analyses of residual chemical contaminants in fish tissue. Perfluorooctane sulfonate (PFOS), a PFAS compound, was identified as a contaminant of concern. Out of the 252 fish tissue samples from the Occoquan River Watershed, 179 samples had elevated PFOS concentrations, see **Table 1**.

In 2024, pursuant to § 32.1-248.01 of the Code of Virginia, VDH developed PFOS fish consumption advisory guidelines that went into effect in 2025. A three-tiered approach is used for issuing a PFOS fish consumption advisory:[1]

[1] VA Town Hall Virginia Regulatory Town Hall View Guidance Document last accessed June 2026.

- Average fish tissue PFOS concentrations ranging from non-detectable to below 10 parts per billion (ppb) will not warrant issuance of a fish consumption advisory.
- When the average PFOS concentrations in fish range from 10 ppb to 20 ppb, VDH recommends limiting consumption of contaminated species to two meals per month.
- When the average PFOS concentration in fish is greater than 20 ppb, VDH recommends that contaminated fish should not be consumed.
- Pregnant women, nursing mothers, and young children should not consume fish from waterways with a PFOS fish consumption advisory.

DISCUSSION

The 2024 - 2025 fish tissue data that *exceeded* VDH's lower screening value (10 parts per billion (ppb)) is presented in **Table 1** and were evaluated further. The number of fish, size, species, and frequency of exceedance of the screening value were considered in determining the need for a PFOS fish consumption advisory. Some fish species tested already have polychlorinated biphenyls (PCBs) consumption advisory in effect for the sampling location.

Table 1. 2024 - 2025 Fish tissue results exceeding VDH's lower screening value.*

Sample Location	Species Name	No. of Fish	Length Range (cm)	Concentration (ppb)	Sampling Year
South Run near Rt. 215 bridge	Largemouth Bass	3	21 - 24	32.2	2024
South Run near Rt. 215 bridge	Bluegill Sunfish	12	14 -17	20.8	2024
Occoquan Reservoir - lower	Largemouth Bass	5	37 - 41	17.9	2024
Occoquan/Belmont Bay near Buoy # 6	Black Crappie	4	21 - 28	22.5	2024
Occoquan/Belmont Bay near Buoy # 6	Yellow Perch	4	21 - 23	16.4	2024
Bull Run near Bull Run Recreation Area	Northern Hogsucker	3	17 - 24	19.1	2024
Occoquan Reservoir - lower	White Crappie	6	24 - 28	11.9	2024
Occoquan Reservoir - lower	Northern Snakehead	3	74 - 78	10.8	2024
Occoquan Reservoir - lower	Carp	3	66 - 71	11.8	2024
Occoquan River near Rt. 1 bridge	Black Crappie	4	26 - 32	54.3	2024
Occoquan River near Rt. 1 bridge	Northern Snakehead	2	63 - 71	16.4	2024
Cub Run near Rt. 658 Compton Road	Bluegill Sunfish	12	13 - 16	19.4	2024
Bull Run/Occoquan Reservoir - upper	Northern Snakehead	3	62 - 76	13.0	2024

Sample Location	Species Name	No. of Fish	Length Range (cm)	Concentration (ppb)	Sampling Year
Bull Run/Occoquan Reservoir - upper	White Crappie	5	25	10.6	2024
Broad Run downstream of Manassas Airport	Bluegill Sunfish	12	13 - 17	16.1	2024
Bull Run near Bull Run Recreation Area	Largemouth Bass	2	29 - 33	11.0	2025
Bull Run near Bull Run Recreation Area	Bluegill Sunfish	11	12 - 15	11.6	2025
Bull Run/Occoquan Reservoir - upper	Bluegill Sunfish	10	15 - 17	11.9	2025
Bull Run/Occoquan Reservoir - upper	Largemouth Bass	5	32 - 42	27.0	2025
Bull Run/Occoquan Reservoir - upper	Carp	3	59 - 63	11.4	2025
Occoquan Reservoir - lower	Largemouth Bass	5	34 - 41	22.9	2025
Occoquan Reservoir - lower	Bluegill Sunfish	10	15 - 17	12.0	2025
South Run near Rt. 215 bridge	Largemouth Bass	6	19 - 25	11.2	2025
South Run near Rt. 215 bridge	Bluegill Sunfish	8	12 - 15	14.8	2025
Occoquan/Belmont Bay near Buoy # 6	Largemouth Bass	5	37 - 44	24.0	2025
Occoquan River near Rt. 1	Largemouth Bass	5	31 - 39	22.1	2025
Cub Run near Rt. 658 Compton Road	Bluegill Sunfish	10	14 - 18	14.8	2025
Occoquan River near Rt. 663, Davis Ford Road	Largemouth Bass	4	38 - 42	11.8	2025
Occoquan River near Rt. 663, Davis Ford Road	Largemouth Bass	4	43 - 46	14.1	2025
Broad Run downstream of Manassas Airport	Largemouth Bass	1	33	11.7	2025
Broad Run downstream of Manassas Airport	Bluegill Sunfish	6	16 - 19	12.5	2025
Broad Run downstream of Manassas Airport	Northern Hogsucker	3	23 - 33	16.0	2025

*Fish analyzed individually or as composite samples. **ppb** = parts per billion. **cm** = centimeters. Length of fish truncated.

CONCLUSIONS

Consuming largemouth bass from the Occoquan River and Reservoir could harm people's health, because the concentration in PFOS is above VDH's upper screening level, 20 ppb.

Consuming more than two fish meals per month of largemouth bass from Broad Run, Bull Run, and South Run could harm people's health, because the concentration of PFOS in largemouth bass are above VDH's lower screening level, 10 ppb.

Consuming more than two fish meals per month of bluegill sunfish from Occoquan River and Reservoir, Broad Run, Bull Run, Cub Run, and South Run could harm people's health, because the concentration of PFOS in those fish are above VDH's lower screening level, 10 ppb.

VDH concludes that more PFOS fish tissue data is needed to determine if consuming northern snakehead and white crappie from the Occoquan River and Reservoir could impact health.

VDH concludes that more PFOS fish tissue data is needed to determine if consuming white crappie from the Bull Run could impact health.

RECOMMENDATIONS

VDH recommends not eating largemouth bass from the Occoquan River and Reservoir.

VDH recommends limiting the consumption of largemouth bass from Broad Run, Bull Run, and South Run to no more than two fish meals per month.

VDH recommends limiting the consumption of bluegill sunfish from Occoquan River and Reservoir, Broad Run, Bull Run, Cub Run, and South Run to no more than two fish meals per month.

VDH recommends additional sampling of northern snakehead and white crappie from the Occoquan River and Reservoir.

VDH recommends additional sampling of white crappie from Bull Run.

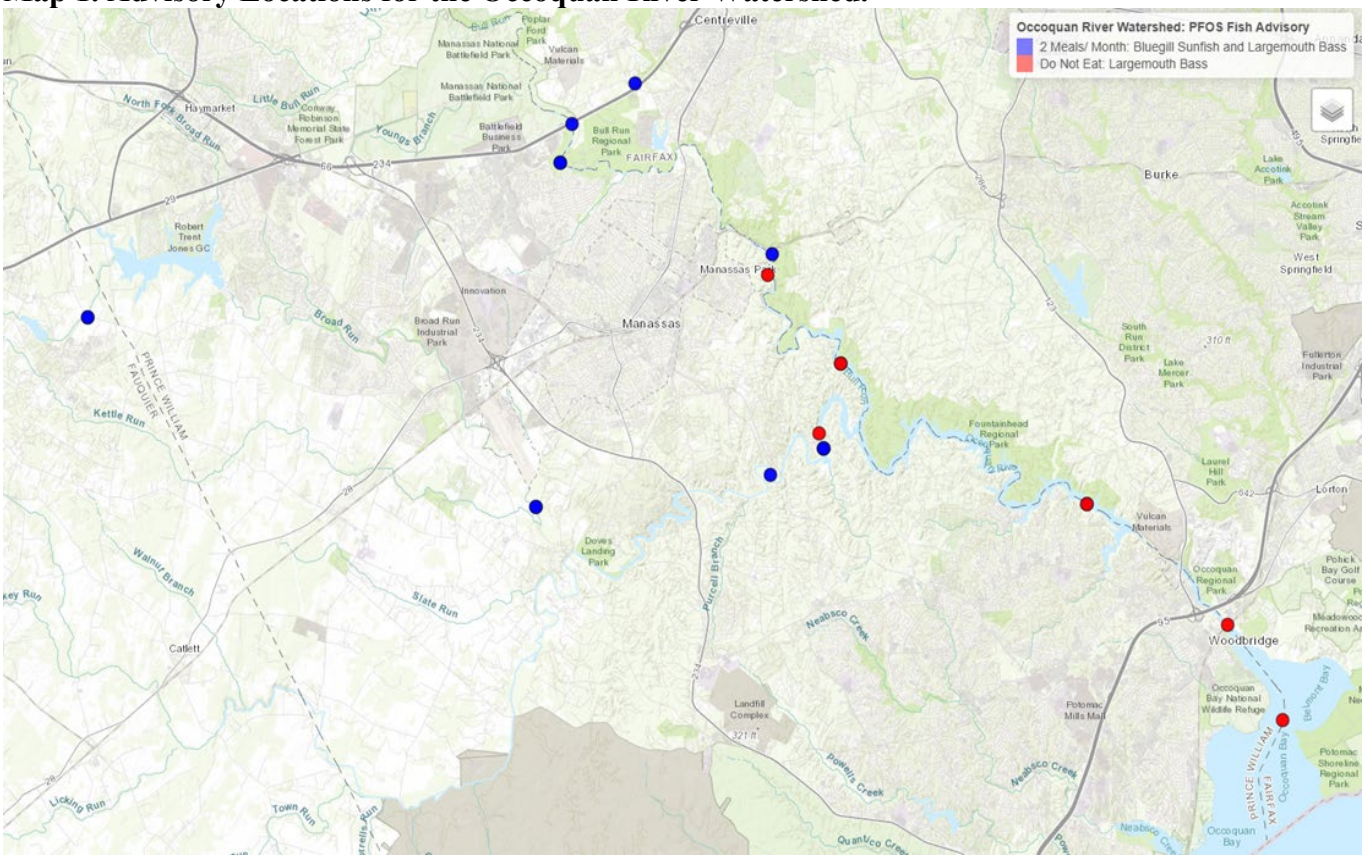
PUBLIC HEALTH ACION

On April 14th, 2026, VDH issued a fish consumption advisory for the Occoquan River, Occoquan Reservoir, Broad Run, Bull Run, Cub Run and South Run, as shown in **Map 1**. VDH advises not eating largemouth bass from the Occoquan River and Occoquan Reservoir. The advisory covers the tidal portion below the Occoquan River from the Occoquan Reservoir dam downstream to Occoquan Bay including Belmont Bay and the backwaters of the Occoquan Reservoir on the Bull Run arm near Hemlock Overlook Regional Park and just upstream of Davis Ford Road on the Occoquan River arm down to the water supply dam of the Fairfax County Water Authority. Localities impacted are Fairfax and Prince William.

VDH advises eating no more than two fish meals per month of largemouth bass from Broad Run from the outlet of Lake Manassas downstream to the confluence with Cedar Run; Bull Run from the I-66 bridge downstream to the backwaters of the Occoquan Reservoir on the Bull Run arm near Hemlock Overlook Regional Park; and South Run from the outlet of Lake Brittle downstream to the confluence with Lake Manassas (Broad Run). Localities impacted are Fairfax, Fauquier, Manassas, and Prince William. A meal is defined as eight ounces of fish.

VDH advises eating no more than two fish meals per month of bluegill sunfish from the Occoquan Reservoir from the backwaters of the Occoquan Reservoir on the Bull Run arm near Hemlock Overlook Regional Park and just upstream of Davis Ford Road on the Occoquan River arm down to the water supply dam of the Fairfax County Water Authority; Broad Run from the outlet of Lake Manassas downstream to the confluence with Cedar Run; Bull Run from the I-66 bridge downstream to the backwaters of the Occoquan Reservoir on the Bull Run arm near Hemlock Overlook Regional Park; Cub Run from the confluence with Elklick Run downstream to the confluence with Bull Run; and South Run from the outlet of Lake Brittle downstream to the confluence with Lake Manassas (Broad Run). Localities impacted are Fairfax, Fauquier, Manassas, and Prince William.

Map 1. Advisory Locations for the Occoquan River Watershed.



Source: DEQ data presented using the R Studio mapping program.

Please let us know if you have any questions or other information to consider.

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